PB-216 692

HANDBOOK ON SANITATION OF RAILROAD SERVICING AREAS. DESIGN AND OPERATION OF SANITATION FACILITIES FOR SERVICING RAILROAD PASSENGER CARS

Public Health Service
Washington, D. C.

1951

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FEDERAL SECURITY AGENCY
PUBLIC HEALTH SERVICE

REPORT ON RAILROAD WATERING POINT SANITATION

CITY	STATE	DATE OF INSPECTION
RAILROAD COMPANY	DIVISION SUPERINTENDANT	LOCAL REPRESENTATIVES CONFERRED WITH
WATERING POINT	SOURCE OF WATER SUPPLY	NO. OF UNITS WATERED DAILY
CLASSIFICATION RECOMMENDED (Check one) ☐ APPROVED ☐ PROVISIONAL ☐ PROHIBITED		EXPIRATION DATE (If provisionally approved)
REPORT PREPARED BY (Name and Title)	AGENCY	

DEFECTS ARE INDICATED BY A CROSS (X)

1. WATER SUPPLY		**5. ICE (continued)**	
No cross connections		Ice washed before use	
No backflow connection		Ice buckets smooth and clean	
Adequate pressure		painted (if necessary)	
2. HYDRANTS		labeled	
Hydrants of acceptable type		properly stored	
Separation from centerline of nearest track satisfactory		Ice carts smooth and clean	
Outlets have quick type coupling		covered	
Outlets directed downward or horizontal		painted (if necessary)	
Outlets less than 18" above rail or surrounding surface completely enclosed with self-closing cover		labeled	
		6. WATER COOLERS	
Hydrant installations adequately drained		Removable coolers flushed each 7 days	
Impervious platform around hydrants		removed for sanitizing monthly	
No connection of drains to sewers or storm drains		proper equipment available	
Manhole drainage entirely separate		properly sanitized	
to surface		records kept in cars	
to sump		Constant temperature bottles properly sanitized	
to subsoil		stored	
If flush type hydrant, bar overflow protected against flooding		**7. WATER FILTERS**	
		Filters serviced in sanitary manner	
Water outlets containing non-potable water labeled and provided with different type hose couplings		**8. TOILETS, WASH ROOMS & CLOTHES LOCKERS**	
3. WATER HOSE		Toilets adequate	
Acceptable material		convenient	
Smooth nozzle		maintenance satisfactory	
Nozzle guard adequate		Handwashing facilities adequate	
Ends not dragged		convenient	
Hose properly protected or stored		properly equipped	
Hose flushed before use		maintenance satisfactory	
Car filling connection flushed before watering		Handwashing signs	
4. WATER BUCKETS		Lockers adequate	
Smooth impervious material		satisfactorily maintained	
Kept clean		Drinking fountains, if provided, satisfactory	
Rinsed before use		**9. EXCRETA DISPOSAL FACILITIES**	
Used only for potable water		No toilet wastes discharges to ground	
Overlapping covers		Soil cans emptied, cleaned and stored properly	
Side delivery with downward directed or horizontal spout		Soil can cleaning facilities adequate and remote from watering facilities	
Painted (if necessary)		backflow protection	
Labeled		Employees wash hands and remove soiled clothing before handling water, food or ice equipment	
Properly stored in clean locked cabinet		**10. GARBAGE AND REFUSE**	
Cabinets located properly		Garbage stored in covered metal cans	
5. ICE		collected or disposed of frequently	
From acceptable source		Satisfactory can washing facilities	
Properly stored		No garbage discharged to ground	
No possibility of backflow through drains		Servicing area free of litter and debris	
Platform for handling			

(Continued on reverse side)

PB 216 692

HANDBOOK ON SANITATION OF

Railroad Servicing Areas

DESIGN AND OPERATION OF
SANITATION FACILITIES FOR SERVICING
RAILROAD PASSENGER CARS

FEDERAL SECURITY AGENCY
Public Health Service
DIVISION OF SANITATION

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Springfield VA 22151

Details of illustrations in
this document may be better
studied on microfiche.

I

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II

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FOREWORD

The standards of sanitary practice appearing in this publication, a handbook entitled "Railroad Servicing Areas," are intended for use as guides by (1) persons who design and operate railroad servicing equipment and facilities, and by (2) health department representatives and others who make periodic investigations or inspections of facilities and operations in servicing areas.

It should be understood at the outset that although the standards appearing on the following pages do not have the legal force of the Interstate Quarantine Regulations, they were written with a view to conforming to the intent of those regulations. Compliance with the standards, therefore, will insure compliance with the Regulations and its amendments. In the event of noncompliance with a standard, however, and failure to correct the reported condition, final corrective action will be based upon the applicability of the regulation concerned. Amendments to the Interstate Quarantine Regulations issued through April 1951 are included herein. In addition, sections of the Regulations having a bearing on methods and practices described in the handbook have been quoted for purposes of quick reference.

A brief description of the inter-relationships of the railroad companies, the State health departments and the Public Health Service of the Federal Security Agency, relative to methods of approving water supplies and watering points, can be found at the back of the handbook in a section entitled "Administrative Procedures."

In addition, a copy of a Public Health Service form—"Report on Railroad Watering Point Sanitation"—is attached to the inside back cover. This form is a revision of the form previously used by representatives of State health departments and the Public Health Service during their annual inspections of servicing area facilities. The sequence of items appearing on the form is identical with the order of appearance of items in the handbook. It is believed, therefore, that railroad officials will find it helpful to have a copy of the handbook available when reviewing reports.

"Railroad Servicing Areas" was prepared by the Interstate Carrier Branch of the Division of Sanitation, Public Health Service, in collaboration with the Joint Committee on Railway Sanitation of the Association of American Railroads. It is one of a set of three handbooks on railroad sanitation standards prepared by the Public Health Service. The other two are entitled "Railroad Passenger Car Construction" and "Dining Cars in Operation."

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This publication supersedes the following publications, insofar as references to design, construction, reconstruction and operation of railroad passenger car servicing facilities are concerned:

Standard Railway Sanitary Code (Reprint No. 604 of "Public Health Reports," July 25, 1920).

Standard Railway Sanitary Code (Supplement No. 46 to "Public Health Reports," May 16, 1924).

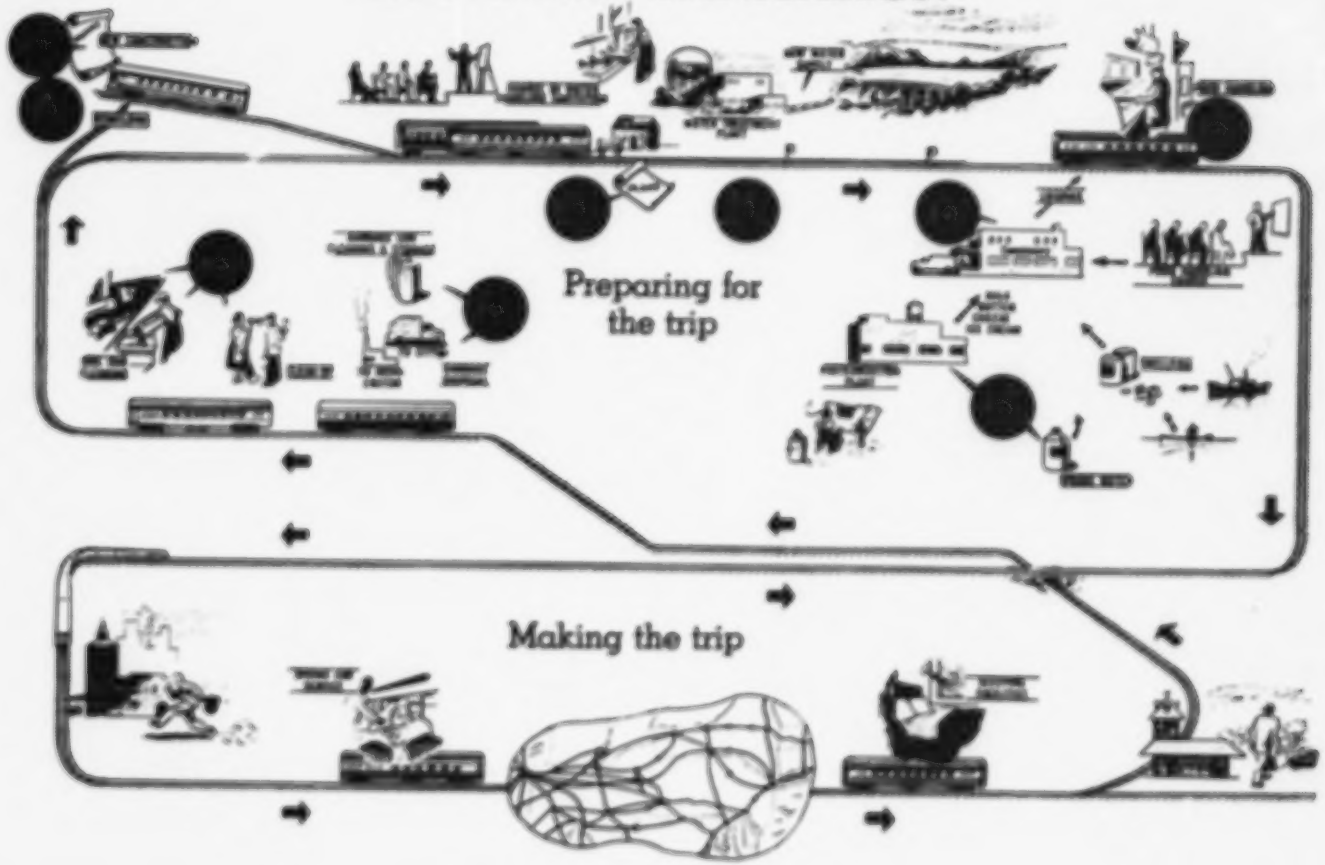
American Railway Association (Circular M. and S. 133, November 24, 1931).

Association of American Railroads (Circular M. and S. 194, August 2, 1937).

Sanitation Manual for Land and Air Conveyances Operating in Interstate Traffic (Reprint No. 2444 of "Public Health Reports," January 29, 1943).

As improved equipment and methods of operation develop, a need for revisions of the existing standards undoubtedly will make itself felt. These developments will be noted and, as circumstances require, supplements to or revisions of this handbook will be made.

RAILROAD SANITATION



WHERE AND TO WHOM APPLICABLE

This handbook is for use by employees of railroads operating as interstate carriers, and by persons concerned with the operation of railroad servicing areas. It covers the types of equipment and the methods of constructing and operating sanitation facilities used in railroad passenger car servicing areas.[1]

INTERSTATE QUARANTINE REGULATIONS—SUBPART F—72.131:

"*Applicability.* Land and air conveyances engaged in interstate traffic shall use only such servicing areas within the United States as have been approved by the Surgeon General as being in compliance with the requirements prescribed in this subpart."

INTERSTATE QUARANTINE REGULATIONS—SUBPART F—72.132:

"*Inspection and approval.* The Surgeon General may inspect any such areas to determine whether they shall be approved. He may base his approval or disapproval on investigations made by representatives of State departments of health."

What is an Interstate Carrier? An interstate carrier is defined as any company or firm which honors through-bills-of-lading or through-tickets that have been issued on an interstate basis, whether or not the conveyances operate interstate. The term "CARRIER" also means a conveyance.

LEGAL DEFINITION OF INTERSTATE TRAFFIC:

INTERSTATE QUARANTINE REGULATIONS—SUBPART A—72.1 (i):

"The movement of any conveyance or the transportation of persons or property, including any portion of such movement or transportation which is entirely within a State or possession, (1) from a point of origin in any State or possession to a point of destination in any other State or possession, or (2) between a point of origin and a point of destination in the same State or possession but through any other State, possession, or contiguous foreign country.

"INTERSTATE TRAFFIC DOES NOT INCLUDE THE FOLLOWING: (1) The movement of any conveyance which is solely for the purpose of (i) unloading persons or property transported from a foreign country, or (ii) loading persons or property for transportation to a foreign country. (2) The movement of any conveyance which is solely for the purpose of effecting its repair, reconstruction, rehabilitation, or storage."

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[1] As referred to herein, a servicing area is understood to be any yard, station, or other location where water, milk, or food is loaded, or where wastes are removed from railroad passenger cars.

CONSTRUCTION PLANS

INTERSTATE QUARANTINE REGULATIONS—SUBPART F—72.133:

"Submittal of construction plans. Plans for construction or major reconstruction of sanitation facilities at servicing areas shall be submitted to the Surgeon General for review of the conformity of the proposed facilities with these requirements."

I. WHEN PLANS ARE REQUIRED. Plans requiring approval include those calling either for new installations or for major repairs or alterations in the servicing facilities used for passenger cars. Plan approval is also required for such portable items as hose nozzles, water buckets, etc. Approval of such items would make their use acceptable at any location similar to the one for which they were originally designed. Minor changes or slight alterations of a single installation may be approved by a Public Health Service regional engineer or a State health agency for compliance with regulations, if railroad officials so desire.

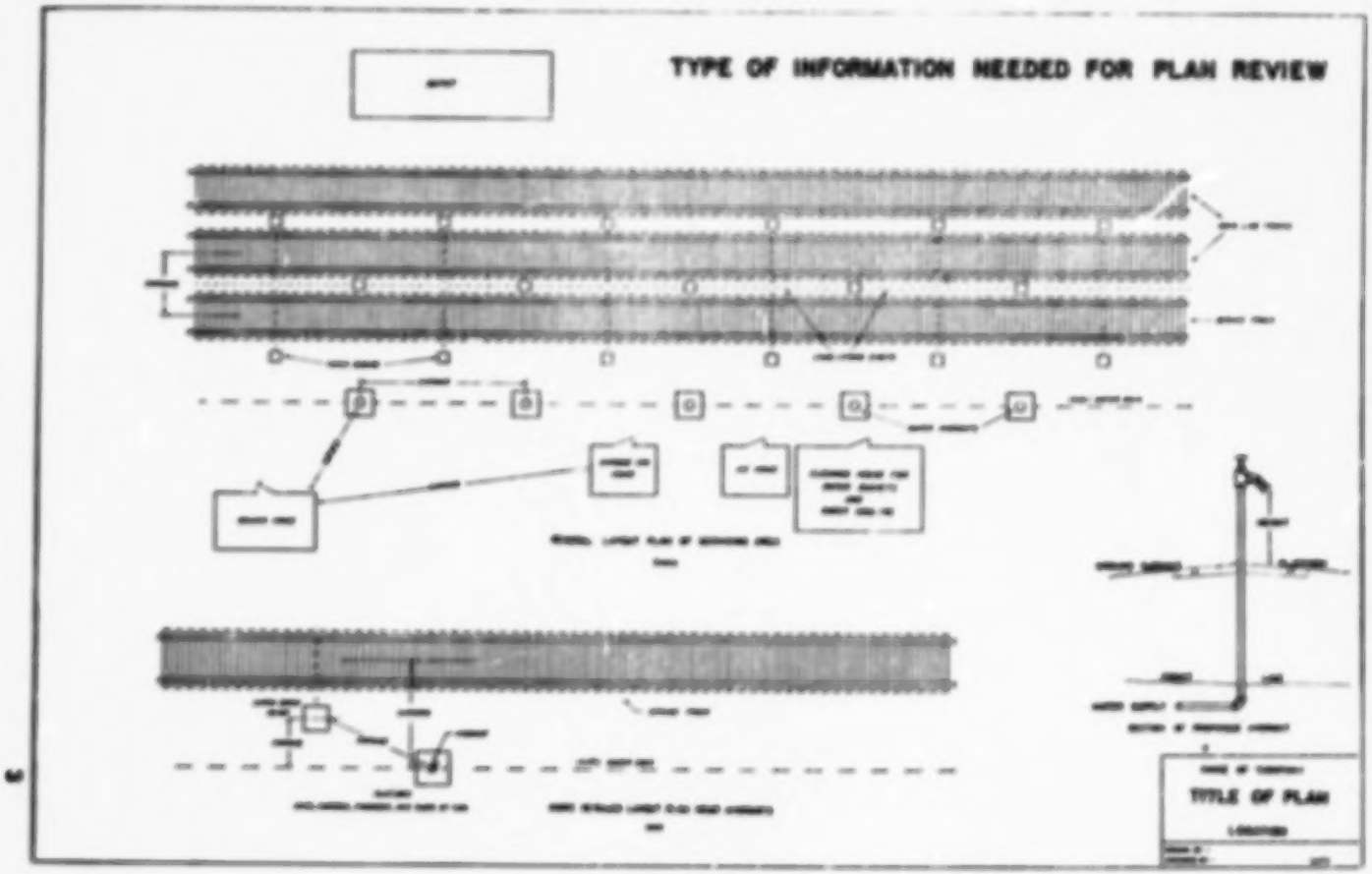
II. PLAN PREPARATION. Plans (and specifications, if available) for installation of stationary objects should ordinarily consist of (1) a general layout of the servicing area (this should show the location of all sanitary facilities, including sewer and water piping); (2) larger scale plans showing specific installations with respect to their immediate surroundings; and (3) detail drawings of specific items to be installed. Detail drawings should include both plan and section views.

III. TRANSMITTAL PROCEDURE. All plans should be submitted in triplicate to the health agency of the State in which the work is to be done. Extra copies should be provided where required. The State health agency will then send its recommendations, with two copies of the plans, to the Public Health Service regional engineer. Formal approval will come from Public Health Service headquarters in Washington, D. C. Plan reports are routed back through the same channels. This procedure assures State clearance before plans reach the Public Health Service. States will give proper consideration to clearing plans with local governmental agencies where required. In the event a State does not wish to review certain plans, two copies should be sent directly to a Public Health Service regional engineer. Since this handbook contains the Public Health Service's standards with respect to servicing areas, railroad companies, States and local agencies using it can be reasonably sure of speedy Public Health Service approval of plans that meet the standards.

GENERAL REQUIREMENTS

INTERSTATE QUARANTINE REGULATIONS—SUBPART F—72.134:

"General requirements. Servicing areas shall be provided with all necessary sanitary facilities so operated and maintained as to prevent the spread of communicable diseases."


TYPE OF INFORMATION NEEDED FOR PLAN REVIEW
TITLE OF PLAN

Servicing area facilities that are used in conjunction with the supplying of food or drink, or the disposal of wastes from conveyances, should be so constructed and operated as to protect passengers and employees from illness resulting from inadequacies in the construction and operation of the facilities.

Interstate Quarantine Regulations—Subpart D—72.101:

"*Water for drinking and culinary purposes; general requirements.* Only potable water shall be provided for drinking and culinary purposes by any operator of a conveyance engaged in interstate traffic, except as provided in § 72.113 (b). Such water shall either have been obtained from watering points approved by the Surgeon General, or, if treated aboard a conveyance, shall have been subjected to treatment approved by the Surgeon General."

The first consideration for a watering point should be the quality of the water at its source of supply. If the water supply is not satisfactory, all water at the loading point must be considered unsafe unless it is treated by acceptable methods and the treatment is adequately supervised by qualified persons. Inspections by State health agencies provide information on each water supply reported in use by the railroads. Inquiries regarding a water supply should be directed to the State health agency or the Public Health Service regional engineer.

Interstate Quarantine Regulations—Subpart F—72.133:

"*Drainage.* All platforms and other places at which water or food supplies are loaded onto or removed from conveyances shall be adequately drained so as to prevent ponding."

When new platforms are constructed in servicing areas, they should be sloped to permit proper drainage. All other surfaces in servicing areas should be suitably sloped for drainage and, if necessary, a storm water sewer system to prevent ponding should be provided. Servicing areas should be free of rat harborages and should be kept clean.

WATERING EQUIPMENT

Interstate Quarantine Regulations—Subpart F—72.136:

"*Watering equipment; general requirements.* All servicing area piping systems, hydrants, taps, faucets, hoses, buckets, and other appurtenances necessary for delivery of drinking and culinary water to a conveyance shall be designed, constructed, maintained, and operated in such a manner as to prevent contamination of the water."

Interstate Quarantine Regulations—Subpart F—72.137:

"*Watering equipment; outlets for unpotable water.* Outlets for unpotable water shall be provided with fittings different from those provided for outlets for potable water and each unpotable water outlet shall be posted with permanent signs warning that the water is unfit for drinking."

INTERSTATE QUARANTINE REGULATIONS—SUBPART F—72.139:

"Watering equipment; ice. If bulk ice is used for the cooling of drinking water or other beverages, or for food preservation purposes, equipment constructed so as not to become a factor in the transmission of communicable diseases shall be provided for the storage, washing, handling, and delivery to conveyances of such bulk ice, and such equipment shall be used for no other purposes."

INTERSTATE QUARANTINE REGULATIONS—SUBPART G—72.153:

"Ice. Ice shall not be permitted to come in contact with water in coolers or constant temperature bottles."

INTERSTATE QUARANTINE REGULATIONS—SUBPART H—72.167:

"Ice; source and handling. Ice coming in contact with food or drink and not manufactured on the conveyance shall be obtained from sources approved by competent health authorities. All ice coming in contact with food or drink shall be stored and handled in such manner as to avoid contamination."

INTERSTATE QUARANTINE REGULATIONS—SUBPART G—72.148:

"Water systems; constant temperature bottles. (e)* Constant temperature bottles and other containers used for storing or dispensing potable water shall be kept clean at all times and shall be subjected to effective bactericidal treatment as often as may be necessary to prevent the contamination of water so stored and dispensed."

I. WATER PIPING SYSTEMS. The water piping system should be of such a size that an adequate positive pressure can be maintained in all parts of it at all time; furthermore, due regard should be given to unusual usage from any part of the system. There should be no cross connection between the potable water system and a water system of questionable quality. In the servicing area, no plumbing of any type should be installed which would permit backflow of contaminated water or other liquids into the potable water system.

Because sewers and drains carry contaminated matter, it is desirable in planning new installations to locate water piping as far away from them as practicable. The safest method for protecting this water from contamination is to place the piping above ground in the track area. This is desirable because the impact of train traffic imparts vibrations to the subgrade which tend to cause pipe leaks; also, cinders used in subgrades generally are corrosive to piping.

Where underground water and sewer pipes cross, it is recommended that water piping be installed above the sewer lines whenever possible. If it is necessary for a sewer line to cross above, or less than 6 feet below, a water line, it is recommended that the sewer line be constructed of extra heavy cast iron pipe with leaded joints, for a distance of 10 feet on each side of the water line. If the sewer line is laid parallel, it is recommended that the water pipe be above and at least 10 feet from it.

*Parts (a), (b), (c), and (d) pertain to conveyances only.

In order that hydrants may be repaired without shutting off a large part of the water system, it is suggested that a shut-off valve be provided between each hydrant and the water main.

II. HYDRANTS. Water hydrants (hereafter the term "hydrant" will include taps and faucets) should be designed, located, installed, and maintained in a manner that will assure protection of the drinking water against contamination.

Problem.—Protecting hydrants against the major sources of contamination, such as:

A. Toilet hopper discharges which might contaminate:
   1. The hydrant proper, either directly or from splashing.
   2. Ground surfaces and, subsequently, subsoil around the hydrant.

B. Sanitary or storm sewers which might contaminate:
   1. Subsoil around the hydrant.
   2. The hydrant drainage system.

C. Surface drainage contamination by:
   1. Flooding or splashing of hydrant outlets.
   2. Water pooling around hydrants which might contaminate subsoil.

D. Handling of hydrant parts.

STANDARDS TO BE OBSERVED:

A. Location.—Hydrants should be located where the possibility of contamination and accidents is minimized.

1. Hydrants used for watering purposes should not be located in toilet rooms, wash rooms, or other places where contamination may exist or result from operating conditions.

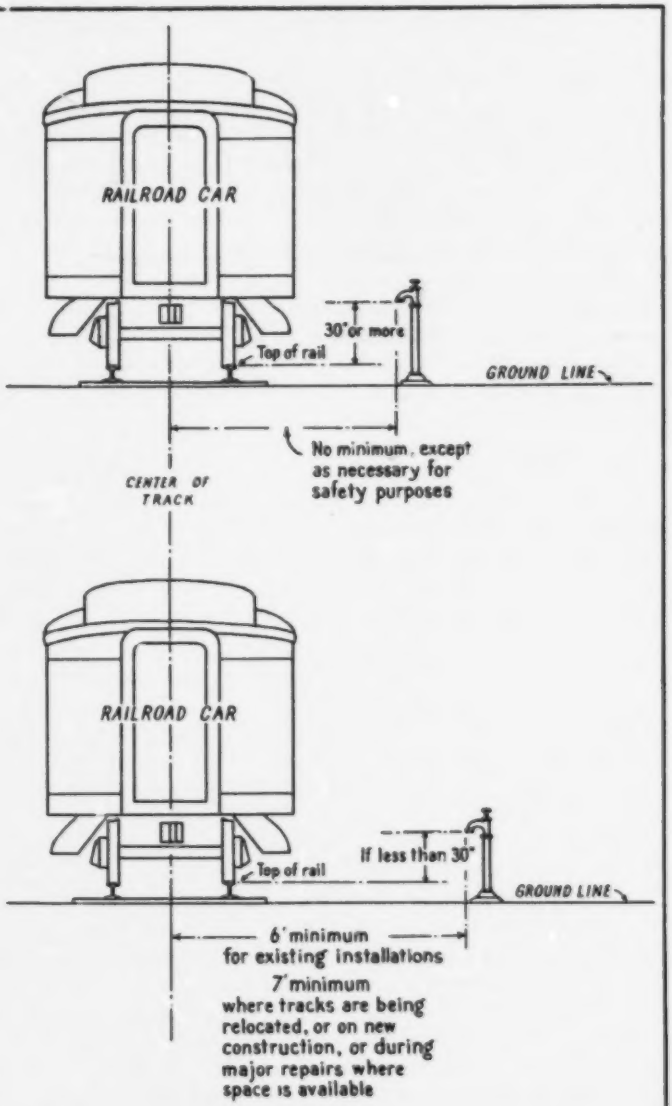
2. If the hydrant is the post type, the required horizontal separation of the outlet from the centerline of the nearest railroad track is based on the elevation of the outlet above the top of the rail.

Minimum requirements for this item are:

(*a*) Hydrants having outlets 30 inches or more above the top of the rail may be located at any distance from the centerline of the track unless otherwise dictated by safety considerations.

(*b*) Hydrants with outlets less than 30 inches above the top of the rail should be located at least 6 feet from the centerline of existing track installations.

(*c*) In the following cases, the minimum distance from the centerline of the track should be at least 7 feet: (1) New track installations, (2) relocation of tracks, (3) at time of major repairs, where space is available.


RAILROAD CAR
30" or more
Top of rail
GROUND LINE
No minimum, except as necessary for safety purposes
CENTER OF TRACK
RAILROAD CAR
If less than 30"
Top of rail
GROUND LINE
6' minimum for existing installations
7' minimum where tracks are being relocated, or on new construction, or during major repairs where space is available

LOCATION OF HYDRANTS (POST OR BOX TYPE)

3. Hydrants should not be located in areas subject to surface water ponding.

4. Hydrants located in unpaved areas should be protected by impervious platforms of a size, slope, and height sufficient to prevent the formation of ponds from spillage and flushings. Platforms should be no less than 3 inches thick and 16 square feet in area. They should be shaped to give maximum protection against rutting of the surface around the hydrant. The height of platforms should be such that changes in elevation of the ground surface will not result in covering of the platforms. However, platforms should not be high enough to present tripping hazards.

5. When hydrants containing nonpotable water must be located in servicing areas for providing boiler water to engines or for some other reason, they should have fittings which will prevent attachment of hoses used for loading drinking water. They should also be labeled with permanent signs warning that the water is unfit for drinking.

B. Design—Types.—Because there are now commercially available several types of hydrants which do not require riser pipe drains (commonly called "weepholes") to prevent freezing, it will be unnecessary hereafter to use hydrants with weepholes in any new servicing area.

The most desirable type of hydrant has an above-ground piping system which is under continuous positive pressure. The watering hose is connected to the system and a swinging arm or automatic winding hose reel helps to hold the outlet end of the filling hose off the ground.

The post-type hydrant with continuous positive pressure to its outlet is considered to be the next most desirable.

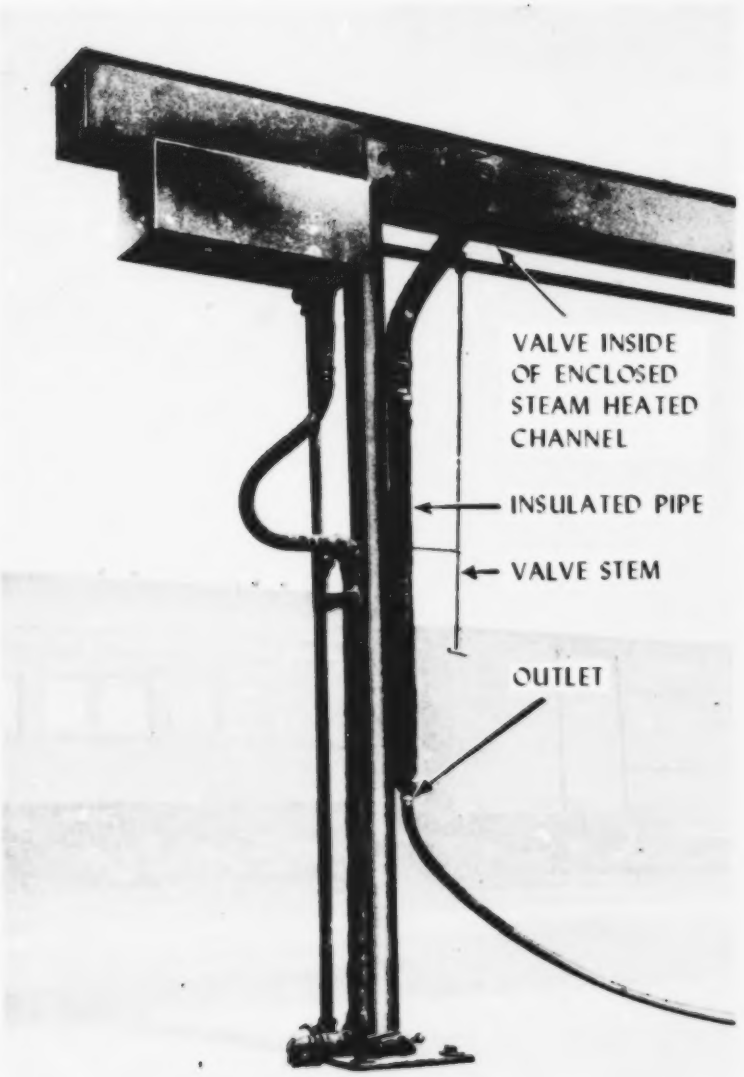
Only under special circumstances, where it is not practicable to use one of the above-described types of hydrants, can flush-type hydrants or post or elevated-type hydrants with underground riser pipe drains, be approved for reconstruction of hydrant facilities in a servicing area.

It is expected that railroad officials will evaluate the situations surrounding each proposed hydrant installation and provide the most suitable type of equipment in each case. State health agencies and Public Health Service regional engineers can offer advice on such installations.

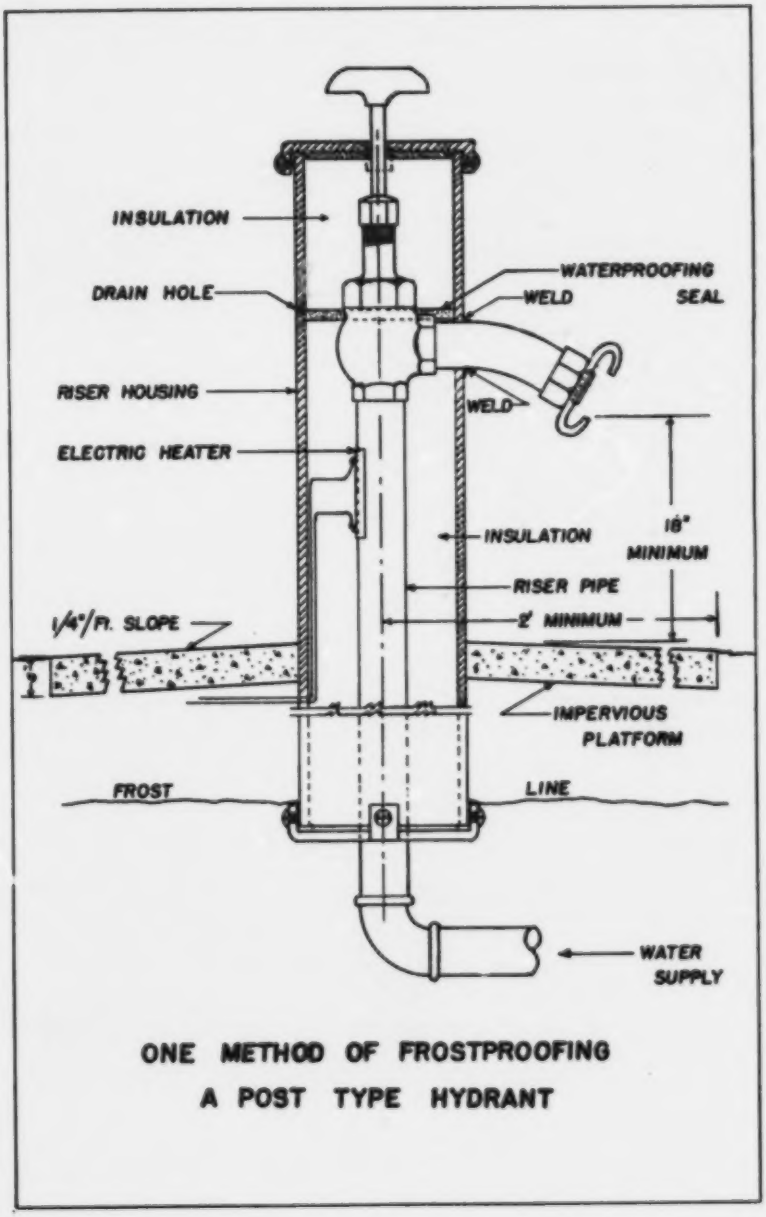
C. Outlets.—Hydrants should be protected against contamination by whatever precautionary measures are indicated.

1. Water systems carrying nonpotable water should not be piped to servicing areas unless absolutely necessary. All hydrants in the servicing area that discharge nonpotable water should be labeled or identified with permanent warning signs stating the water is unfit for drinking.

2. Hydrant outlets should be equipped with a type of coupling that permits quick attachment or removal of the hose. (This does not apply to installations where the hose is permanently attached to the hydrant outlet.) The couplings should be entirely different from coupling equipment used on hydrants discharging water of unsafe quality.



One suggested method of frostproofing an overhead hydrant.



ONE METHOD OF FROSTPROOFING
A POST TYPE HYDRANT

3. Hydrant outlets should terminate in bends or goosenecks directed downward if they are not properly protected by a cover. In no case should an outlet terminate upward.

4. It would be desirable for all hydrant outlets to be covered, but when located as described below they should be protected by means of a durable, close-fitting, self-closing cover:

(*a*) *Within* 15 feet of the centerline of the nearest track and less than 18 inches above the *top of the rail* or the *surface* (platform or ground) at the hydrant, whichever is the higher;

(*b*) *Beyond* 15 feet from the centerline of the nearest track and less than 18 inches above the *surface* at the hydrant.

The cover should be so designed as to protect the outlet against contamination while the hydrant is not in use.

5. In the construction of flush-type hydrants, the following features should be observed:

(*a*) The hydrant box should be durable and watertight, and should be provided with a watertight, self-closing cover which overlaps and extends downward over the edge of the box by at least one-half inch. One of the following additional methods of protection should also be provided:

(1) The upper edge of the hydrant box should extend at least 1 inch above the surrounding platform. When hydrants are located on platforms used by passengers, the surrounding surface may be built up on a slope of one-half inch per foot, or less, to within one-half inch of the top of the box. This will minimize the hazard to passengers while still allowing for the required one-half inch overlap of the box cover. The edge of the overlapping cover may be sloped away from the hydrant box to further minimize the hazard to passengers.

(2) The top of the hydrant box cover may be set flush with the platform, if the box is protected from contamination by a surrounding drainage channel which is at least 2½ inches deep, 3½ inches wide and sloped one-fourth inch per foot to a pipe or a connecting channel having an equivalent area and slope and opening directly to the edge of the platform.

(*b*) An overflow opening at least 2 inches in diameter which discharges to the ground surface should be provided in the side of the hydrant box. (See item E. 3 for details.) This opening provides an overflow outlet in case the hydrant box drain becomes clogged.

D. Operation.—All hydrants, regardless of type, should be so operated as to protect the sanitary quality of the water. A faucet, hydrant outlet, or hose nozzle should never be inserted into a water bucket or constant temperature bottle at time of filling.

E. Drainage.—Drainage around hydrants should be sufficient to remove all surface and waste water to prevent contamination of the water in the hydrant riser pipe, the outlet, and any other watering appurtenances.

1. No hydrant box drain or riser pipe drain should be connected directly to any storm or sanitary sewer. (Any drain line receiving surface drainage should be considered a storm sewer.)

2. All drain lines receiving drainage from more than one hydrant box or hydrant riser pipe drain should be water-tight and at least 3 inches in diameter, and should discharge to one of the following:

(*a*) The ground surface, at a point not subject to flooding.

(*b*) A sump, from which waste water is pumped either to the ground surface or to a sewer through an air gap connection located above grade. Duplicate pumps should be provided. If desired, several hydrant riser pipe drains may be connected to one drain line. The sump described above may receive both hydrant box drainage and riser pipe (weep hole) drainage but the use of a single line for carrying both types from the point of origin to the sump is not satisfactory.

(*c*) Although not usually desirable, it may be necessary in some installations to drain hydrant appurtenances to porous subsoil. Where this is necessary the riser pipe drains should terminate at least 10 feet below the ground surface. This is satisfactory only if there is no evidence of existing or potential contamination of the sub-soil at that point. Percolation tests should be made prior to construction to determine whether the subsoil will absorb the desired drainage. In cases where sewers are located above and within 10 feet laterally of a proposed riser pipe drain outlet, some other means of disposing of drainage should be adopted. When hydrant box drainage is also discharged to porous sub-soil, the point of discharge may be at any depth suitable for proper absorption but it should be separated at least 10 feet horizontally from the riser pipe drain outlet.

3. Flush type hydrant boxes should have an overflow opening at least 2 inches in diameter in the side. If a horizontal drain at least 2 inches in diameter is constructed so that its invert is level with the lowest part of the interior of the hydrant box, and if the drain is sloped to and discharged to a free outfall, the pipe may serve both as an overflow and a drain for the hydrant box.

(*a*) The invert of the overflow drain for the hydrant box should be at least 2 inches below the bottom of the hydrant outlet.

(*b*) If drained to the track area, the invert of the drain should be level with or above the top of the rail, so as to minimize clogging, stoppage, or flooding.

(*c*) If a pipe is used, it should be straight so as to permit rodding, and except under unusual circumstances, it should not be longer than 10 feet. It should also have a downward slope to its outlet of at least one-fourth of an inch per foot.

III. WATERING HOSES

Problem.—Using hoses to deliver water from hydrants to conveyances without contaminating the water.

STANDARDS TO BE OBSERVED:

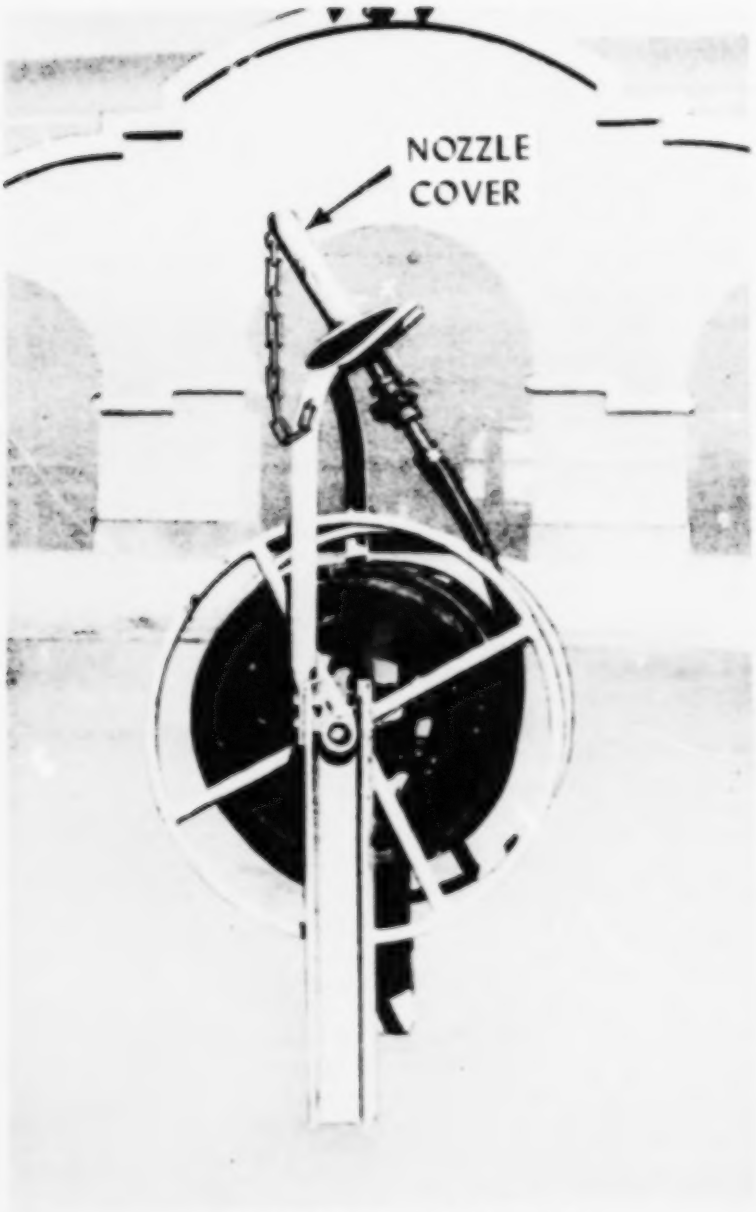
A. Hoses should be of serviceable material which conforms to the specifications of the Association of American Railroads, or their equivalent.

B. Nozzles should be of smooth material. Nozzles which connect to the car by quick attachment couplings are desirable. If a slip-joint type nozzle is used, the end should not be frayed.

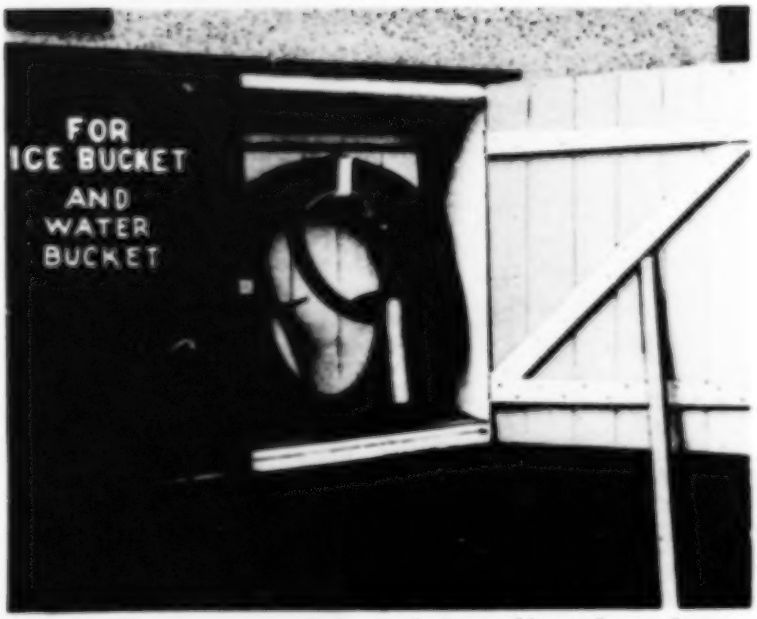
C. The hydrant end of the hose should have a quick attachment type coupling. This does not apply to installations where the hose is permanently attached to the hydrant outlet.

D. Both the hydrant end (if detachable) and the nozzle end of the hose should be prevented from touching the ground or any contaminating material, including pools of water, on the ground. Guards, disks, or other devices which protect the nozzle ends from contamination should be provided and properly maintained. Many factors are involved in determining whether a particular kind of protecting device will keep the nozzle off the ground. Some of these factors are: Material and weight of hose, material and weight of nozzle cap or cover, if used, and use of short pieces of material to adapt a nozzle for a particular type of car. In any case, simple disks, if used, should be at least 6 inches in diameter. Valves at the filling end, if used, should not be placed on the nozzle side of a disk or protective device.

E. Unless hose ends are protected from contamination by suitable cover caps when not attached to conveyances or hydrants, they should be stored on special reels or in special lockers or pits. If pits are used, proper drainage should be provided. If cover caps are used for protecting hose ends, they should be smooth on the inside to facilitate cleaning, and should be flushed out each time the hose is used. They should be designed so that they can be held in place firmly. They should be kept in place whenever the ends of the hoses are not attached to conveyances or hydrants. Flush type hydrant boxes can be suitably designed to protect hose ends, but this type of storage cannot be approved if the nearest edge of the hydrant box is closer than 7 feet to the centerline of the tracks. If hose reels are used, they should be designed so that hose nozzles face downward and are at least 18 inches above the ground or platform, unless caps are provided to protect the nozzles from contamination. If keeper chains are used for tying hose nozzle cover caps to hoses or above-ground hose reels, they should be attached to the closed ends of the caps.



Hose reel with hose nozzle cover attached.



Storage cabinet protects water buckets, ice buckets, and hoses when not in use.

F. After connecting the hose to the hydrant, and before using any water from it, the hose should be thoroughly flushed. The water filling connection on the car should also be flushed just before the hose is attached for watering the car.

IV. WATER BUCKETS

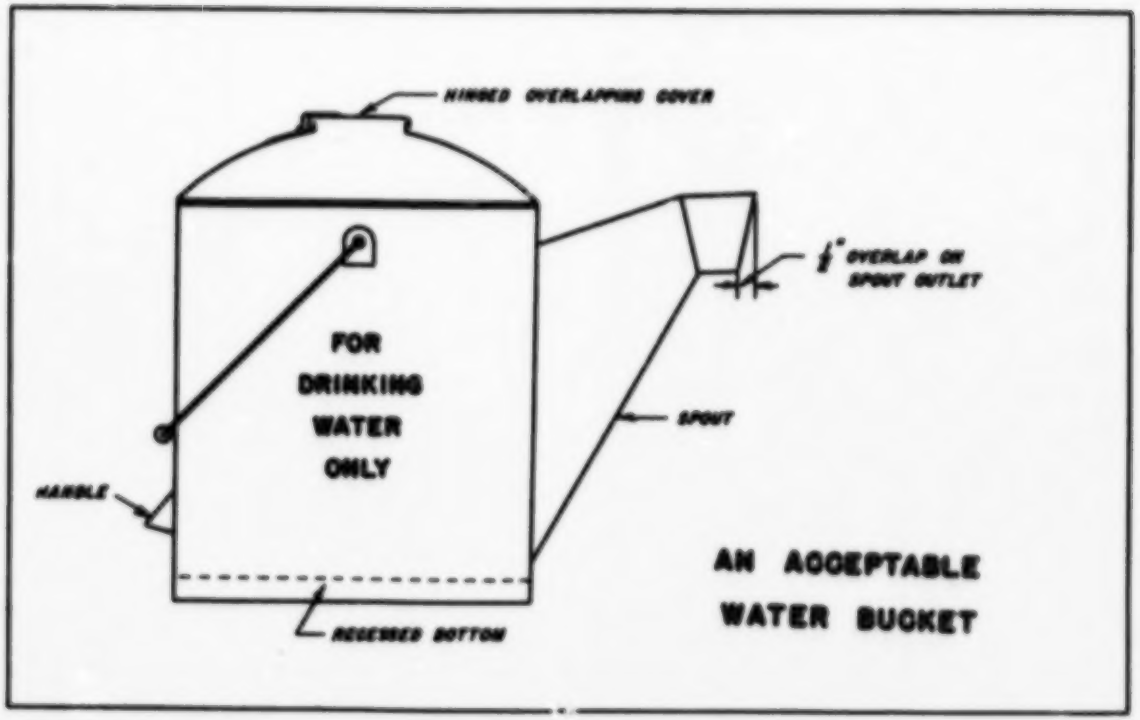
Problem.—Preventing contamination while delivering water from hydrants to certain types of drinking-water tanks.

STANDARDS TO BE OBSERVED:

A. Buckets should be easily cleanable and provided with overlapping covers which are fastened to the bucket. Buckets should be kept clean. They should be thoroughly rinsed before use and their covers should be kept closed. They should be used only for handling potable water.

B. Each bucket should have a spout on the side for rapid emptying. The spout should be designed to terminate either horizontally or downward. It should have no rough seams which might harbor dirt and make cleaning difficult.

C. If buckets are made of stainless steel, monel metal, or other bright noncorrosive material, they should be labeled "For Drinking Water Only."


HINGED OVERLAPPING COVER
½" OVERLAP ON SPOUT OUTLET
FOR DRINKING WATER ONLY
SPOUT
HANDLE
RECESSED BOTTOM
AN ACCEPTABLE WATER BUCKET

If they are made of other materials, their exterior surfaces should be painted white before they are labeled.

D. Storage cabinets should be provided and should be labeled "For Drin'-ing Water Buckets Only." They should have tight-fitting doors with locks and should be painted white on the inside. Storage cabinets may be installed on ice carts for convenience. If the cabinets are constructed of stainless steel, monel metal, or other bright, noncorrosive material, no painting, other than labeling, is necessary.

E. If stationary storage facilities for water buckets are provided, they should be located at least 100 feet from soil can washing facilities unless some special type of construction exists which would justify an exception.

V. ICE

Problem.—Preventing contamination to ice during the manufacturing, storage, and handling stages.

STANDARDS TO BE OBSERVED:

A. Ice should come from sources approved by competent health authorities.

B. Ice should not be placed in the water compartments of conveyance water coolers.

C. The ice storage house should be constructed with floor drains that are not subject to backflow from sewers or other drains. The house should be located at least 100 feet from soil can washing facilities unless some special type of construction is provided which would justify an exception.

D. A platform with smooth, impervious, slotted bottom should be provided for washing, cracking, and chipping ice before it is placed in ice carts. To permit proper drainage, the bottom of the platform should be raised above the floor.

E. An approved water hydrant (faucet or tap) with suitable hose should be provided for washing ice. The hose should be of such length and connected at such an elevation that its outlet end cannot touch the floor or other stationary surfaces which might be contaminated.

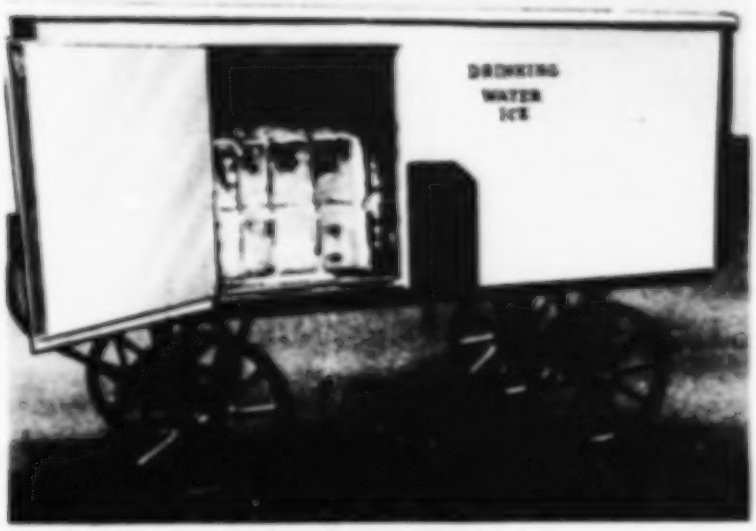
F. If ice crushers are used, they should be easily cleanable and provided with tight covers. They should be covered when not in use and maintained in a clean condition.

G. Buckets for handling ice should be made of a smooth, impervious material and designed to facilitate cleaning. They should be clean at all times. Canvas containers should not be used.

H. Ice carts should be constructed of or lined with impervious, easily cleanable material. They should be equipped with suitable drains and should be tightly covered.

I. Whenever ice buckets are not in use, they should be stored in tight lockers attached either to the ice cart or constructed near the ice storage house.

J. If the outsides of ice buckets and ice carts, and the insides of storage lockers for water buckets and ice buckets, are constructed of stainless steel, monel metal, or other bright, noncorrosive material, painting is not necessary. If these articles are made of any other material, they should be painted white. The outside surfaces of ice buckets, bucket storage cabinets, and carts should be labeled "Ice."



Covered cart protects ice.

VI. CONVEYANCE WATER EQUIPMENT MAINTENANCE

Problem.—Maintaining water facilities of conveyances in a sanitary condition.

STANDARDS TO BE OBSERVED:

A. Water coolers of the removable type, and constant temperature bottles, should be cleaned and bactericidally treated at least once each month. Also, they should be flushed or rinsed thoroughly, either at the end of each round trip or at 7-day intervals. Records should be kept to show dates of flushing and cleaning of removable type coolers used on each car.

B. Closed water systems on conveyances should be flushed with potable water at least once each month. Records showing the date and location of flushings should be kept aboard each car.

C. Paper drinking cups for use on passenger cars should be stored in their original cartons, which in turn, should be stored in a separate compartment of the locker used for storing water buckets, ice buckets, or water hoses, unless a separate locker, similarly designed and maintained, is used for storing the cartons.

D. Approved methods and equipment for properly sanitizing removable coolers and constant temperature bottles should be used. Sanitizing operations should be conducted in a fly-tight building. The equipment should not be used for cleaning garbage cans or soil cans. The coolers or bottles should be cleaned by washing in warm water which contains a suitable detergent. They should then be bactericidally treated by one of the following methods:

1. Immersion in 170° F. clean water for 2 minutes or in boiling water for one-half minute. This method requires the use of at least two adjacent deep sinks fitted with an impervious drainboard—one sink for the washing process, and the other for the bactericidal process. A thermometer to check the temperature is necessary if 170° F. water is used.

2. Immersion in a lukewarm chlorine solution containing at least 50 parts per million of available chlorine if hypochlorites are used, or a concentration of equal bactericidal strength if chloramines are used. Three adjacent deep sinks fitted with an impervious drainboard are necessary for the washing, rinsing and bactericidal processes which make up this method. A suitable kit for testing the strength of the chlorine solution is also needed.

3. Treatment in a steam cabinet equipped with an indicating thermometer located in the coldest zone and with a valve to permit the discharge of cold air when steam is admitted. The containers should be kept in the cabinet for 5 minutes, if at 200° F. temperature. If the cabinet temperature is 170° F., the containers should be treated for 15 minutes. Separate washing facilities are necessary when this type of equipment is used.

4. Treatment in a hot air cabinet equipped with an indicating thermometer located in the coldest zone. Containers should be treated for 20 minutes, with cabinet temperature at 180° F. Separate washing facilities are necessary when this type of equipment is used.

5. Equipment that is too large to immerse may be treated (a) with live steam in those cases where the steam can be confined in the equipment, (b) by boiling water rinse, or (c) by spraying or swabbing with a chlorine solution of 100 parts per million.

6. Any other method determined by the Public Health Service to be effective.

VII. CLEANING WATER FILTERS

Problem.—Servicing water filtering equipment without contaminating the water in the system.

STANDARDS TO BE OBSERVED:

A. If filters are used on conveyances, they should be handled in a sanitary manner. If it is necessary to handle any of the filter parts that come in contact with water, they should be bactericidally treated afterward.

EMPLOYEE CONVENIENCES

INTERSTATE QUARANTINE REGULATIONS—SUBPART F—72.140:

"*Employee conveniences.* (*a*) There shall be adequate toilet, washroom, locker, and other essential sanitary facilities readily accessible for use of employees adjacent to places or areas where land and air conveyances are serviced, maintained, and cleaned. These facilities shall be maintained in a clean and sanitary condition at all times.

"(*b*) In the case of diners not in a train but with a crew on board, adequate toilet facilities shall be available to the crew within a reasonable distance but not exceeding 500 feet of such diners.

"(*c*) Drinking fountains and coolers shall be constructed of impervious, nonoxidizing material, and shall be so designed and constructed as to be easily cleaned. The jet of a drinking fountain shall be slanting and the orifice of the jet shall be protected by a guard in such a manner as to prevent contamination thereof by droppings from the mouth. The orifice of such a jet shall be located a sufficient distance above the rim of the basin to prevent backflow."

TOILETS, WASHROOMS AND CLOTHES LOCKERS

Problem.—Maintaining cleanliness of employees, their clothing, the equipment they use, and the servicing area in which they work.

STANDARDS TO BE OBSERVED:

A. Toilets, clothes lockers, and washrooms for employees should be provided at convenient locations. They should be maintained in a sanitary condition. Toilet paper should be available in suitable dispensers. Hand washing facilities should be near the toilets. Soap and sanitary towels should be placed adjacent to the hand washing basins. Individual paper towels, clean individual cloth towels, and certain types of roller towels are satisfactory. A warm-air jet in lieu of towels is considered satisfactory. If a roller towel is used, each user should be able to use one or more clean sections. Signs advising employees to wash their hands before resuming work should be placed in conspicuous locations. If the facilities are aboard a railroad car, suitable waste disposal facilities should be provided.

B. Drinking fountains, where provided, should be constructed of impervious material.

1. The orifice of the fountain should be of nonoxidizing material set at an angle from the vertical so as to prevent the water from falling back into the orifice. Any opening in the fountain water supply line (including the orifice) should be at least three-fourths inch above the overflow edge of the fountain bowl.

2. The end of the fountain orifice should be protected by a non-oxidizing guard to prevent the user's mouth and nose from coming in contact with the orifice.

3. The jet of water coming from the orifice should not touch the guard.

4. The water supply line should be situated where it cannot be submerged in waste water in the event the waste bowl drain becomes clogged.

5. The fountain unit should be maintained in a sanitary condition.

DISPOSAL OF BODY DISCHARGES

INTERSTATE QUARANTINE REGULATIONS—SUBPART F—72.141:

"*Disposal of human wastes.* (*a*) At servicing areas and at stations where land and air conveyances are occupied by passengers the operations shall be so conducted as to avoid contamination of such areas and stations by human wastes.

"(*b*) Toilet wastes shall be disposed of through sanitary sewers or by other methods assuring sanitary disposal of such wastes. All soil cans and removable containers shall be thoroughly cleaned before being returned to use. Equipment for cleaning such containers and for flushing nonremovable containers and waste carts shall be so designed as to prevent backflow into the water line, and such equipment shall be used for no purpose connected with the handling of food, water, or ice.

"(*c*) All persons who have handled soil cans or other containers which have come in contact with human wastes shall be required to wash their hands thoroughly with soap and warm water and to remove any garments which have become soiled with such wastes before engaging in any work connected with the loading, unloading, transporting or other handling of food, water or ice."

EXCRETA DISPOSAL FACILITIES

Problem.—Disposing of excreta from railroad cars standing in yards or stations so as to minimize contamination of water, ice, and food handled in the servicing area.

STANDARDS TO BE OBSERVED:

A. Some means should be provided for preventing the discharge of toilet wastes from occupied cars in servicing areas or at station stops. This may be accomplished by (1) locking toilet rooms, (2) placing soil cans under toilet hopper outlets, (3) connecting toilet hopper outlets directly to sewers by means of flexible watertight piping, or (4) any other means which may be developed. Receptacles need not be placed under toilet hoppers during the cleaning and testing of conveyances if the toilets contain no body discharges or refuse. There should be adequate policing to assure that excreta is not discharged onto the ground in station and servicing areas.

B. If soil cans are used to prevent the contents of toilet hoppers from being discharged to ground surfaces in servicing areas or station stops, the following standards should be observed.

1. Soil cans should be constructed of watertight, durable, easily cleanable material. They should be designed with an open top which fits car hopper outlets closely, yet facilitates cleaning, inspection and removal.

2. Soil can wastes should be disposed of in special hoppers, or by other recognized means.

Suggestion.—The most suitable method for disposing of soil can wastes is through a properly trapped hopper connected to a sewer. The hopper should be provided with a rack on which the can top may rest, a watertight cover, and hot water or steam connection. The valves preferably should be operated by foot pedals, and water nozzles should be so located in the hopper as to assure thorough cleaning of the cans.

3. Soil cans should be cleaned after each use. Cleaning equipment for soil cans should be kept separate from apparatus used for cleaning other equipment and should be plainly labeled.

4. Minimum facilities for cleaning soil cans should include the following:

(*a*) A manhole or hopper connected to a sewer for disposing of the contents.

(*b*) An impervious floor surrounding the manhole or hopper. If the floor is not drained to the manhole, a separate drain should be provided.

(*c*) Water under pressure and a hose with nozzle, or other suitable washing facilities. The water line pressure should be at least 20 pounds per square inch.

5. During the cleaning operation every care should be taken to avoid contaminating the potable water supply. One method is to equip the water supply lines used for soil can cleaning with backflow prevention devices on the discharge side of control valves. The backflow preventer should be located at least 4 inches above the highest point the top of a soil can would reach when in washing position; or, if a hopper type washer is used, it should be at least 4 inches above the overflow rim of the hopper.

6. Soil can washing facilities preferably should be located at least 100 feet from water or food servicing operations. When new soil can washing facilities are constructed or when existing facilities are reconstructed, they should be housed in a fly-tight building. If the same building is to be used for housing these and other facilities, a solid partition should be erected. Entrance doors to such facilities should be separated and hung to open outward.

7. Space for storage of cleaned soil cans should be provided either in the washing room or at a location apart from other equipment. Clean soil

cans should be kept in enclosed storage whenever they are not in use on conveyances. Dirty cans should be emptied and washed immediately after removal from conveyances.

8. Cans should be so thoroughly cleaned that no visible particles remain.

9. All cleaning and storage facilities for soil cans should be maintained in a sanitary manner.

10. All persons handling soil cans, or other cans which have come in contact with body discharges, should wash their hands thoroughly with soap and warm water before engaging in any work connected with the loading, transporting, unloading, or handling of water, food, or ice. These persons should also wear clean outer garments when working with water, food, or ice.

GARBAGE DISPOSAL

INTERSTATE QUARANTINE REGULATIONS—SUBPART F—72.142:

"*Garbage disposal.* (*a*) Watertight, readily cleanable, nonabsorbant containers with close-fitting covers shall be used to receive and store garbage.

"(*b*) Can washing and draining facilities shall be provided.

"(*c*) Garbage cans shall be emptied daily and shall be thoroughly washed before being returned for use."

GARBAGE AND REFUSE

Problem.—Handling, storing, and disposing of garbage and refuse so as to discourage infestation by rats, other vermin, and flies which ultimately would contaminate food, ice, and water used on railroad cars.

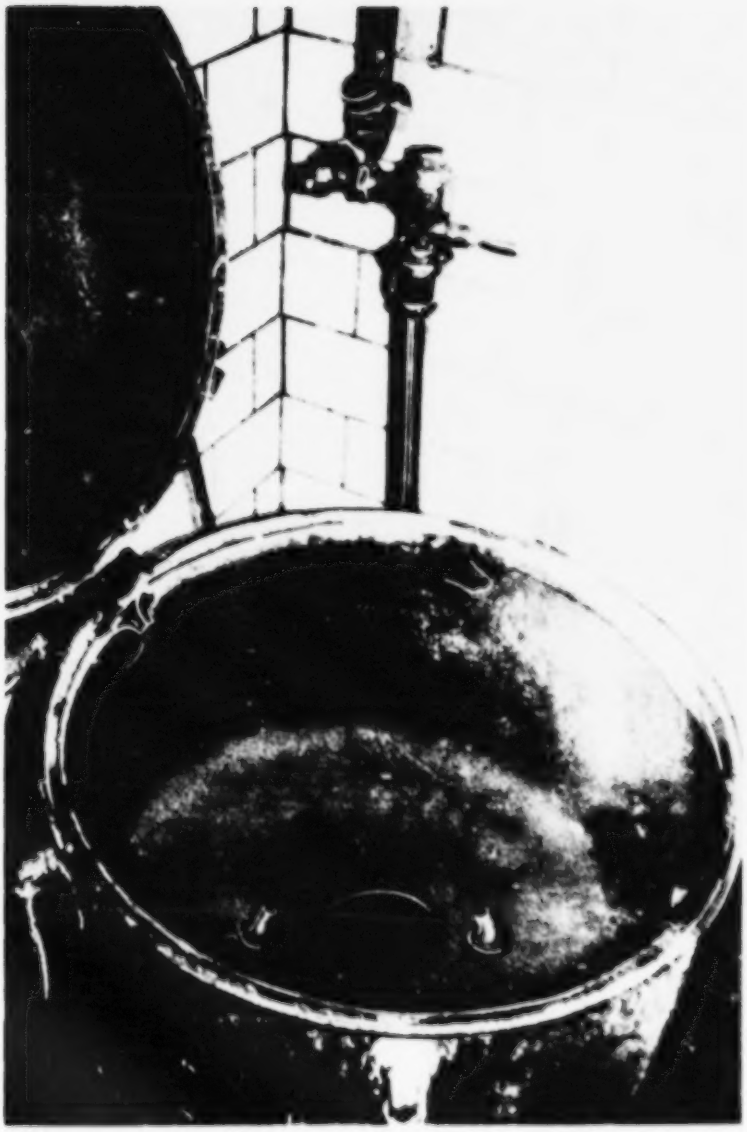
STANDARDS TO BE OBSERVED:

A. Garbage containers should be constructed of watertight, durable, easily cleanable material. Lids should fit tightly to prevent flies from entering the cans before the garbage is removed.

B. Garbage cans should be stored on an adequately drained and impervious platform unless the garbage is disposed of immediately after removal from the conveyance. Cans containing garbage should be kept covered to prevent flies from coming in contact with the contents.

C. Garbage should be disposed of as frequently as necessary to prevent a nuisance. If city collection facilities are not used, other facilities should be provided for disposing of garbage in a sanitary manner.

D. Garbage cans should be thoroughly cleaned after each use. A fly-tight enclosure should be provided for washing and bactericidal treatment of the cans. Soil can cleaning facilities may not be used for cleaning garbage cans. Minimum facilities for cleaning cans should include a fly-tight enclosure, with concrete floor sloped to a suitable floor drain, hot and cold running water (steam may be substituted for hot water), and a hose. Waterline pressure should be at least 20 pounds per square



Soil cans are emptied and cleaned in washer, which is connected directly to a sewer. Washer is equipped with water and steam jets for cleaning both inside and outside surfaces of soil cans.

inch. An approved type of backflow preventer should be located on the discharge side of the water control valve. It should be located at least 4 inches above the highest elevation the top of the garbage can would reach when in the washing room where a hose is used. If a washing hopper or fixed nozzle is used, the backflow preventer should be at least 4 inches above the overflow rim of the hopper or the nozzle, whichever is the higher.

E. Garbage grinding units, if provided on food service cars, should not be operated in servicing areas or stations unless provision is made to collect and dispose of the garbage in a sanitary manner.

F. Combustible material such as paper should be disposed of regularly. The servicing area should be kept free of litter and debris.

ADMINISTRATIVE PROCEDURES

The usual procedures followed in the inspection and classification of water supplies and watering points are as follows:

(1) Inspections are generally made at yearly intervals by representatives of State health departments. Sanitary defects in the water supply, if any, and recommended methods of correction are discussed with the water supply representative. Sanitary defects of watering points, if any, and recommended methods of correction are discussed with the local railroad official.

(2) One copy of the report of inspection, with recommendations, is sent to the Public Health Service regional engineer concerned, while another copy usually is sent to the responsible local railroad official. The regional engineer reviews all reports and makes arrangements for notifying the home office of the railroad as to the sanitation classification of the watering point.

(3) When a watering point is classified as being provisionally approved, the inspecting agency (usually the State health department) notifies the responsible local railroad official that recommended corrections should be completed by a given date and that another inspection will be made on or about that date.

(4) Failure on the part of the railroad to make the corrections generally results in a notice to the top official of the railroad responsible for all watering point sanitation.

(5) If an inspection shows that a watering point is sufficiently hazardous to warrant prohibiting its use, the Public Health Service regional engineer notifies the top railroad watering point official by telephone, telegraph, or air-mail letter that use of the watering point should be discontinued immediately. Reinspections of watering points that have been prohibited for use are not made until the inspecting agency is notified that the recommended corrections have been made.

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